

P O W E R
SPRAYING

1913

FITZHENRY-GUPTILL CO.

49 North Washington Street, Boston, Mass.

135 First Street, East Cambridge, Mass.

We do not follow—We lead.

We do not assemble—We manufacture.

POWER SPRAYING



SPRAYING THE UNITED STATES CAPITOL GROUNDS WITH OUR STANDARD "A" SPRAYER

FITZHENRY-GUPTILL COMPANY

BOSTON, MASSACHUSETTS

FITZHENRY-GUPTILL COMPANY



SOME OF OUR SPRAYERS AND WORK BEING DONE BY THEM
(Center group operated by Col. William D. Sohier in his North Shore spraying operations)

INTRODUCTORY



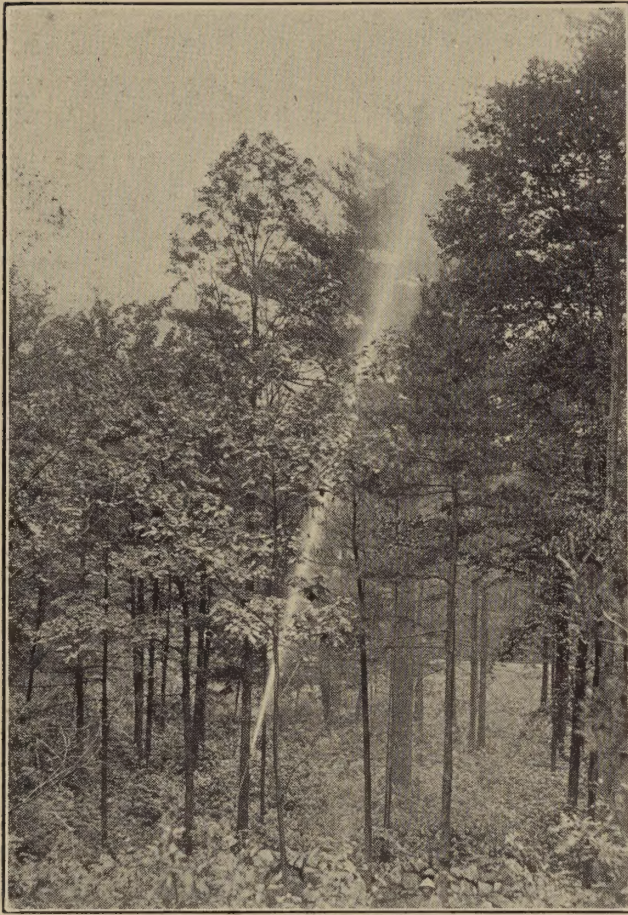
CITY OF BOSTON OPERATES
10 STANDARD "A" SPRAYERS

In presenting to the public our 1913 catalog, "Power Spraying," we desire to call attention to the essential difference between "solid stream" and "mist" spraying and to the several types of HIGH DUTY "solid stream" power sprayers designed and manufactured solely by us.

We do not believe it well, in a book of this size, to attempt a lengthy discussion of, "Does spraying pay?" because this is an undisputed fact; or to print an elaborate set of spraying tables and formulas. To do so intelligently would require much space and not only burden the reader with much needless literature, but with the task of singling out for himself a set of tables and formulas best suited to his needs. We believe it better that anyone wishing to spray, and not familiar with

what solutions he desires to use, would apply directly to any of the State Agricultural Colleges, Experiment Stations, or the United States Department of Agriculture who, with their well-organized staffs, are better able to advise him than any manufacturer of power sprayers. And again, we strongly urge the man engaged in this work to secure from time to time, the publications of these departments and keep in touch with the latest spraying formulas which are constantly changing to meet conditions.

The realization of this fact prompted us, when entering this field of manufacture, to devote our entire energies to the perfecting of a type of power sprayer which at that time was in its infancy; and to what degree we have succeeded, we believe, is attested by the fact that the United States Department of Agriculture in its New England spraying operations; United States War Department; United States Capitol Grounds; District of Columbia; Massachusetts State Forester; Massachusetts Metropolitan Parks; Massachusetts Metropolitan Water and Sewerage Board; City of Boston Parks and Public Grounds Departments; Albany, N. Y. Park Department; Providence, R. I. Forestry Department; and over 100 others have adopted our method and that we now manufacture and sell over 90% of the HIGH DUTY apparatus used in the United States.



WOODLAND SPRAYING ON THE
NORTH SHORE

There probably is not a farmer in this country who does not realize the importance of spraying if he expects to reap the harvest of his labors and realize a profit from capital invested. For many years spraying operations in the United States were confined, principally, to agricultural crops and, until recent years, the economic entomologists devoted almost their entire time to the study of methods for the suppression of insect and fungus life which levy such heavy tax on these crops.

With the advent of our economic foresters, and the demand from them and our park superintendents for a method whereby forest, park and shade trees could be sprayed economically, the devising of a more powerful method became necessary.

In fruit or crop spraying, best results are secured by what is termed, "mist" spraying, which is accomplished by delivering the solution at a moderate pressure (150 pounds to 175 pounds per square inch) through a nozzle having a fine hole which is usually fitted with some mechanical device for spreading the spray that the greatest area may be covered at close range with the least amount of solution.

In extensive spraying operations, where tall trees are to be sprayed, this method is far too expensive to permit of any extended work, as each tree must be climbed individually and the mist nozzle manipulated through the foliage that all the leaves may be coated. This fact led the late J. A. Pettigrew, in 1895, while superintendent of Prospect Park, Brooklyn, New York, to attempt spraying on a large scale by what he termed, "the solid stream method." This he accomplished by rigging up a portable steam boiler and pump, in connection with a watering cart, and using an ordinary fire nozzle with a small bore. An interesting pamphlet, dealing with this experiment, was written by Dr. L. O. Howard and published by the United States Department of Agriculture in 1896.

Nothing further was attempted, along this line, until 1905, when, owing to the serious outbreak of the gypsy moth in eastern Massachusetts, the great demand for a powerful spraying apparatus prompted the assembling, from such stock parts as could be purchased in the open market, of several machines. At this time 200 pounds pump pressure was con-

sidered ample for good **“solid stream”** work, but it was left to a series of tests, conducted by us several seasons later, to demonstrate that **at least 225 pounds per square inch nozzle pressure** was required to do efficient work,

From these tests we found that to properly spray by the **“solid stream”** method, a machine that will maintain, **at least, 300 pounds** per square inch on a $\frac{1}{4}$ " open bore nozzle is absolutely necessary, because, with a lower pressure after it has suffered the loss due to hose friction, the solution is not delivered with sufficient force to properly break the stream into a fine mist after attaining its height. In ordinary street tree or park spraying, the length of hose in use often exceeds 500 feet, while in wooded areas, for practical work, the lines are often extended to 1500 feet and, in rare cases, we have seen as high as 1800 feet in use. From this, it is only a matter of simple calculation to realize that if a nozzle pressure of 225 pounds is to be maintained, the pump, or initial, pressure must often be raised to **over 350 pounds**. This holds particularly true, even on short lines of hose, if the spraying operations are on some considerable height above the sprayer.



NOT SPRAYED

SPRAYED

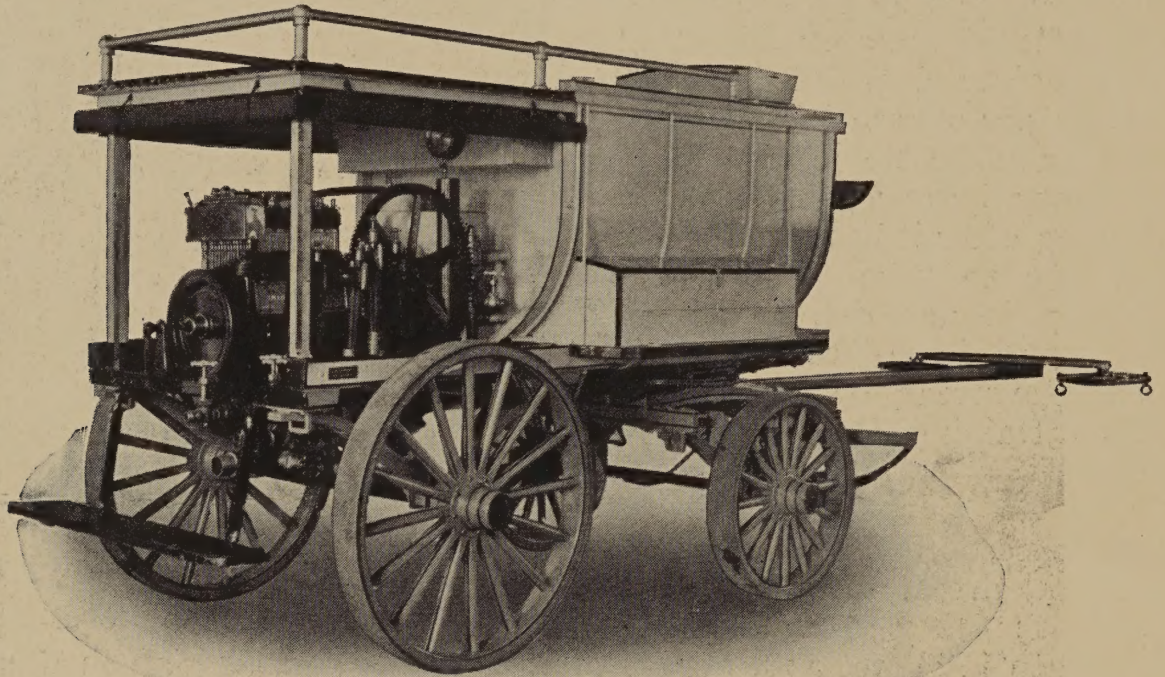
The term **“solid stream”** is often taken advantage of by the manufacturers of semi-high powered sprayers who do not, for obvious reasons, go to the trouble of explaining that, unless the pressure be great enough to thoroughly burst the stream into a very fine mist after its maximum height has been reached, the solution would reach the foliage in coarse drops, where it would rapidly collect and run off, carrying the poisons with it.

Our original intention, when entering this field, was to design an extremely light, portable apparatus for heavy woodland spraying, but ever since its introduction, it has been **a favorite for municipal and park work** as well. By its use, the cost of large tree spraying is cut to nearly **one-fifth that of mist work**.

Col. William D. Sohier, Chairman Massachusetts Highway Commission, writes, in speaking of this sprayer, “We found that our new spraying machines were doing much more efficient and economical work than the older ones. They actually threw over the tops of the trees and

made a finer spray, and were more economical because, with their additional power, nearly double the territory could be covered in one day with the same labor cost."

In our 1913 Standard "A" Power Sprayer, we present a high duty apparatus which has stood the test of time and, with the exception of a few refinements, is a duplicate of our 1912 model. In this sprayer, which is the lightest, most compact, powerful and accessible machine on the market, will be found simplicity of design and ease of operation **unknown to any other make.**



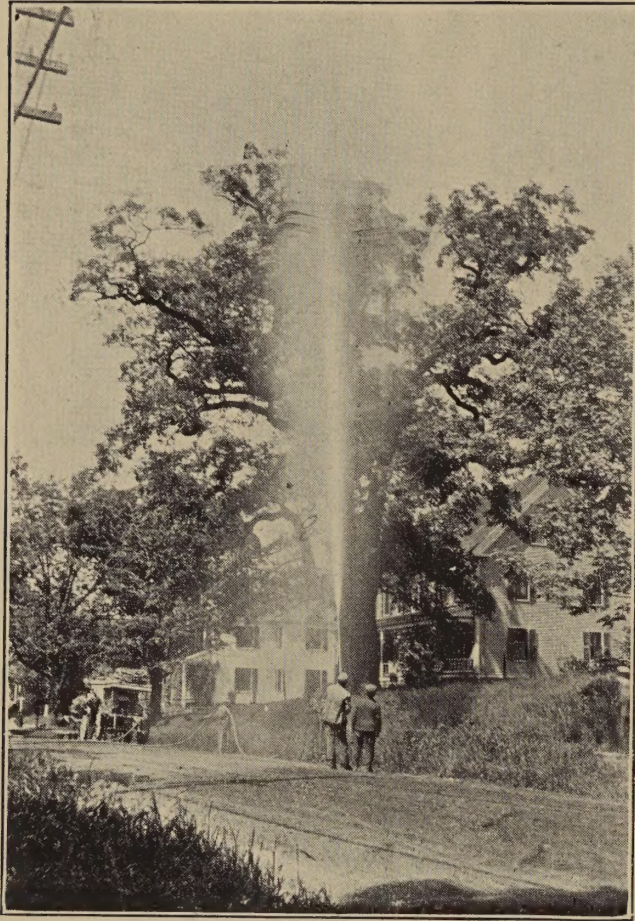
STANDARD "A"

On an endurance test, conducted for the City of Boston Park Department, we operated **four stock machines at one time** for three consecutive hours, maintaining **from 275 pounds to 300 pounds** nozzle pressure on **two $\frac{1}{4}$ " open bore nozzles**, delivering free, discharging approximately 58 gallons per minute. On several public demonstrations, we have operated **stock machines** for a greater length of time, maintaining **350 pounds** nozzle pressure on one $\frac{1}{4}$ " open bore nozzle, delivering free. From this, it is evident that this sprayer is capable of performing all that is required of a high duty apparatus for **"solid stream"** work.

Briefly, it consists of a "U" shaped tank of 400 gallons capacity, with a detachable cab, covered on top with best oiled duck, and detachable curtains, of the same material, to protect the machinery. These are mounted on a platform, cut-under, 2-horse spring gear with compound brakes and 5" tread, Sarven wheels. These running gears are manufactured in our own shop and are made from New England, air-dried stock, ironed throughout in the best caravan style with Norway iron and steel, hand forged. They are painted three coats, striped, lettered and varnished.



OUR STANDARD "A" OPERATING A "WORTHLEY" NOZZLE ON
1450 FT. 1-IN. HOSE. WOODLAND SPRAYING ON
THE NORTH SHORE



TOWN OF DEDHAM OPERATING A
STANDARD "A" SPRAYER

The pump is our special, **phosphor bronze**, triplex, of **cylindrical design**, with extra large valves to permit of **high speed when filling**. The **plunger stools are raised** in such a manner that the wrist pin thrust is **always between metal guides**. Through our individual ports, **any valve may be removed, without disturbing another**, by simply unscrewing a cap. By a unique arrangement of specially treated and formed leather flanges and bronze supporting rings, we are able to pack our pumps in such a manner that **weepage is almost entirely eliminated** and **friction reduced to its minimum**. An important feature of our 1913 model, is our new **drop forged 40-point carbon steel crank**. This replaces the steel casting formerly used on our sprayers and still in use on all other makes.

oline engine of **special design**, equipped with **Bosch high tension magneto** and **mechanical oiler**, and is connected to the pump by our **special expanding clutch** and **phosphor bronze pinion gear**.

The pump is operated by a **4-cylinder, 4-cycle, 10-14 HP gas-**

The engine is cooled by a coil of pipe submerged in the solution tank. This coil is fed by a supply tank which is fitted with a glass water gauge from which the operator may know that there is water in the cooling system.

The gasoline tank is extra large, holding sufficient fuel for two days operation.

The mixer is our special **paddle agitator**, consisting of wooden paddles mounted on bronze blades which are keyed to a **Tobin bronze shaft**, and driven **directly from the engine** by a **gear transmission** running in an **oil bath**.

Our **special safety release valve**, which exhausts back into the solution tank from the delivery line, **does not raise the pressure** when the nozzles are shut off.

The air chamber is made of drawn steel and, wherever the pipes are subjected to high pressure, they are of double strength with extra heavy unions, fittings and valves.

A hydraulic pressure gauge is so placed as to be easily read by the operator.

FITZHENRY-GUPTILL COMPANY

This high duty apparatus is a machine designed and built throughout as a power sprayer and not assembled from stock parts. We manufacture and not assemble.



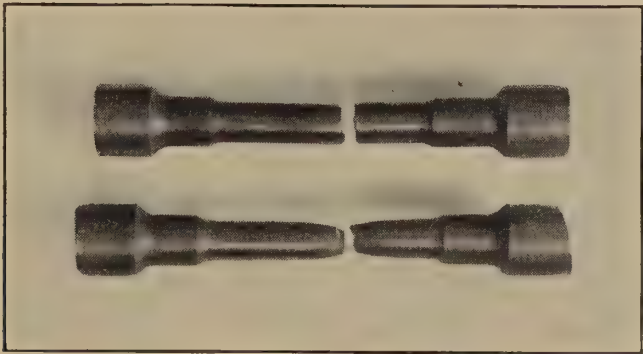
ONE OF THE MANY USES TO WHICH OUR SPRAYERS HAVE BEEN PUT OUT OF SPRAYING SEASON

PHYSICAL TEST OF CAST AND DROP FORGED CRANK SHAFTS

Upper Cut Illustrates Specimen from Cast Crank, which gave the following results : Lower Cut Illustrates Specimen from our Drop Forged Crank, which gave the following results :

Elastic Limit lbs. □ "	Ultimate Strength lbs. □ "	Elongation % in 2"	Contraction of Area %
40,000	70,500	12.5	5.3

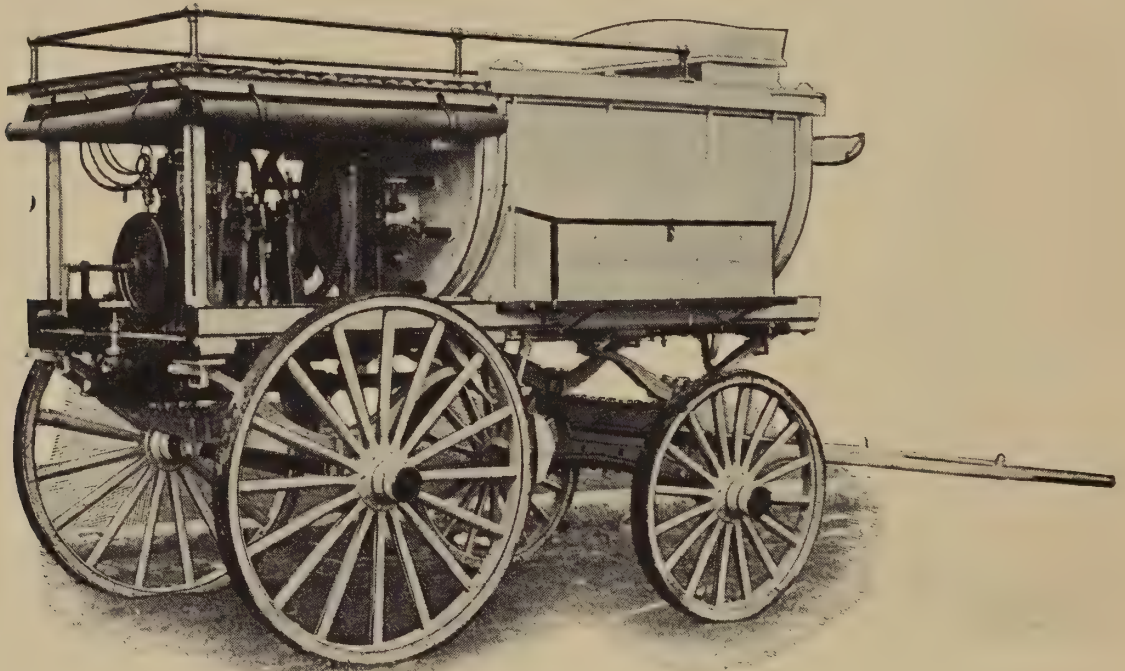
Elastic Limit lbs. □ "	Ultimate Strength lbs. □ "	Elongation % in 2"	Contraction of Area %
74,000	111,500	15.6	55.7



TESTED SPECIMENS

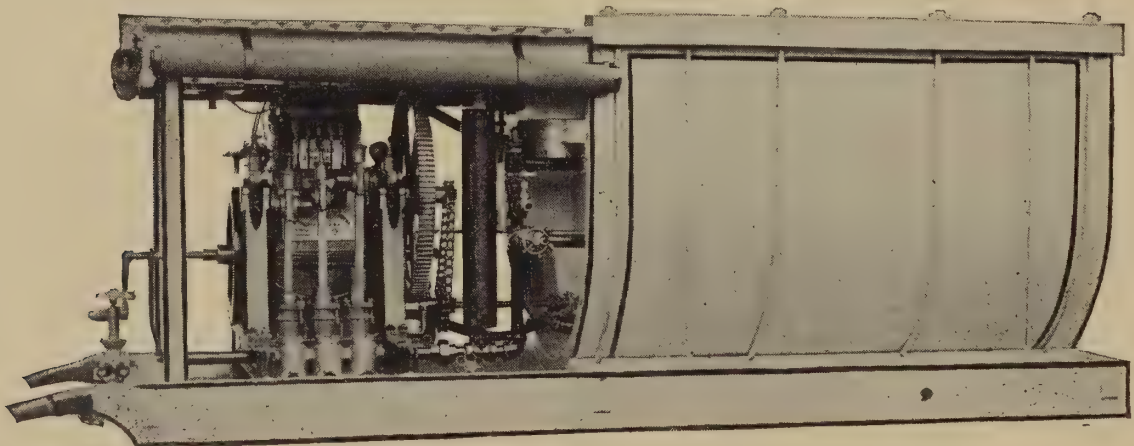
ASK THE MAN WHO KNOWS

In our 1913 Standard "B" power sprayer, we offer the smaller cities, towns, parks and private estates, with trees of the average height and only small wooded areas to be sprayed, a single horse apparatus, of extremely light weight, capable of handling a 3-16" "solid stream" nozzle at 250 pounds pressure and with which it is possible to spray the average shade tree from the ground without the use of extension rods or climbing.



STANDARD "B" SPRAYER

This machine is, so far as is practicable, a **proportional reduction of our Standard "A"**. It is equipped with our (2" x 3") phosphor bronze, **triplex pump of cylindrical design**, operated by a special **2-cylinder, 4-cycle, 3-4HP** gasoline engine with **Delco ignition system**. These are mounted, with a 200 gallon tank, on a single horse, spring, cut-under gear, with 3" tread Sarven wheels and compound brakes.



STANDARD "B" PUMP AND ENGINE WITH 200 GALLON TANK ON SKIDS

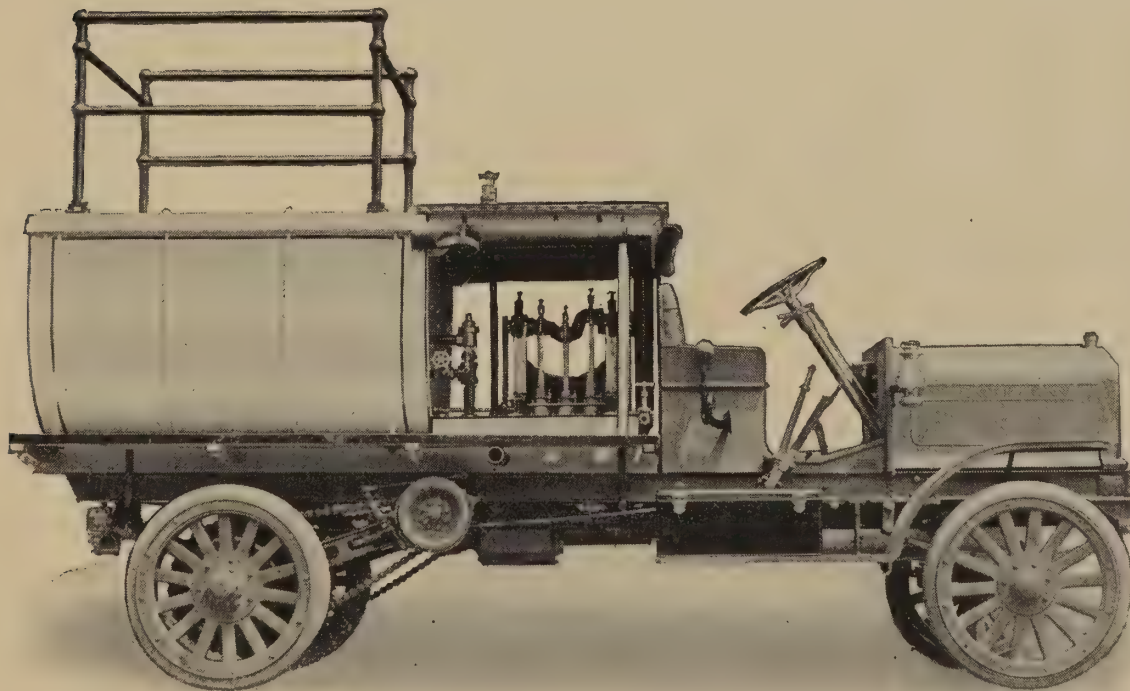
We also mount any of our regular pumps and engines on skids with tanks of varying capacities to fit standard wagon bolsters or for use in any regular wagon body.



POWER TRUCK SPRAYER OPERATED BY
THE TOWN OF CANTON, MASS.

In our **1913 power truck sprayer**, we offer the last word and maximum in high duty spraying apparatus. With this machine the cost of roadside spraying is reduced to its minimum because with it, it is possible to spray **both sides of the highway** at the same time while travelling. One of the serious drawbacks in the earlier attempts of roadside spraying was the time occupied in going after and returning with a load of water.

In spraying operations where the water supply is at a great distance, the time saved en route by such a machine is evidenced by the fact that only **19 minutes** was occupied in making a round trip of **4.8 miles** with this machine, including drafting 400 gallons of water from a brook,



"F-G" SPRAYER ATTACHMENT MOUNTED ON "F-G" CHASSIS
(Both Truck and Sprayer operated by the same engine)



AUTO TRUCK SPRAYER, OPERATING TWO $\frac{1}{4}$ IN. WORTHLEY NOZZLES



SPRAYING BOTH SIDES OF HIGHWAY
NORTH SHORE SPRAYING OPERATIONS

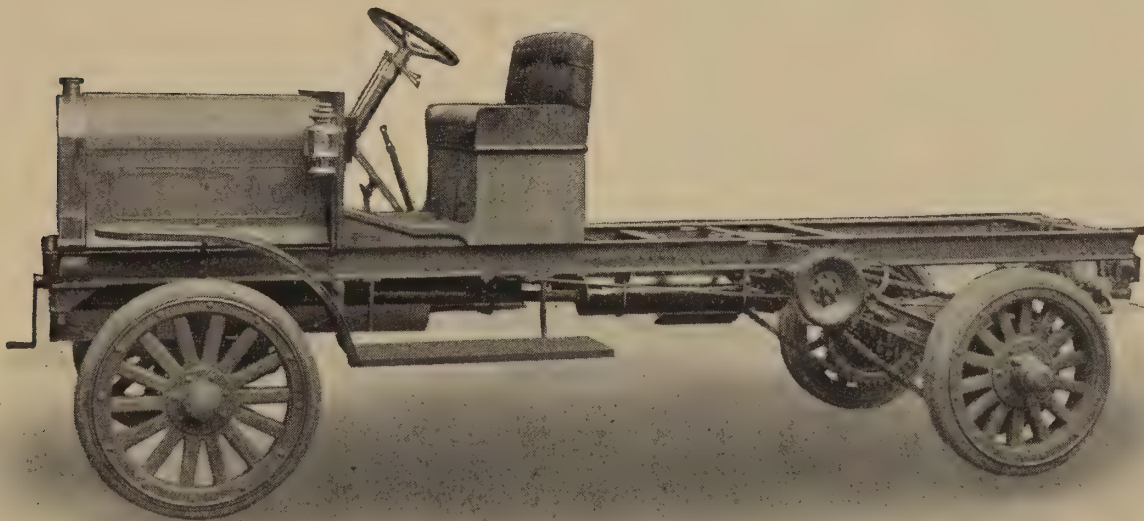
while nearly an **hour and a half** would be occupied with a **horse drawn machine** to perform this same task.

In this machine, we have incorporated the desirable features of our **Standard "A" Sprayer** and all that is modern in truck design.

The chassis is built in our shop and is of simple and rigid construction, with many over size parts, to withstand the double strain of propelling itself, while operating the sprayer attachment.

The sprayer attachment is fitted with our **Standard "A" Pump**. This is operated by a special transfer arrangement, taken directly off our straight line drive, and is controlled from the driver's seat.

When the spraying season is over, by releasing four clamps, the **sprayer attachment may be removed** and replaced by a regular truck body, thereby converting the same into a 3-ton truck.

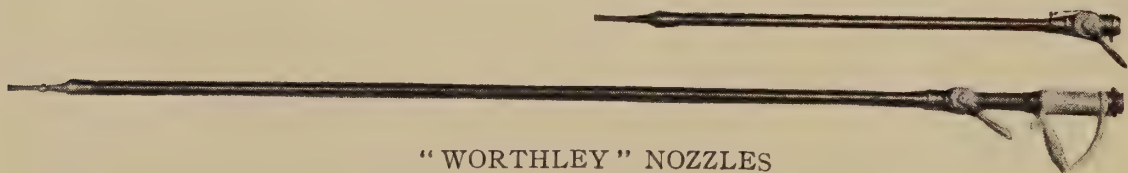


"F-G" CHASSIS WITH SPRAYER ATTACHMENT REMOVED



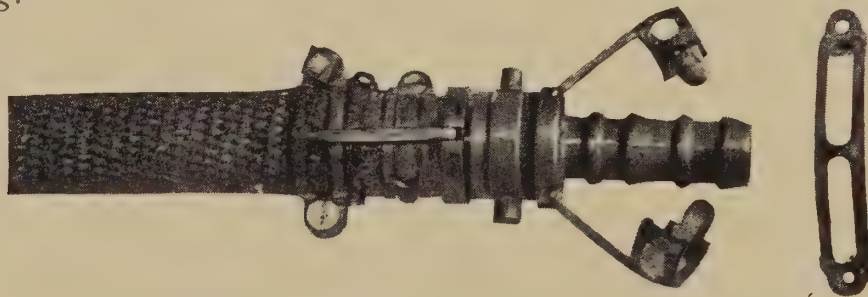
ONE OF THE 10 STANDARD "A" SPRAYERS
USED BY THE CITY OF BOSTON OPERATING
A "WORTHLEY" NOZZLE.

In our Worthley nozzle, we have, by careful design and proportioning, **so reduced the friction** that a stream can be thrown with it 15 feet, or more, higher than with the regular so-called "solid stream" nozzles of the same bore. For woodland work or the spraying of extremely high trees, we recommend our large Worthley nozzle which consists of a special condensing head and Hopkins on the end of a brass tube, fitted with a full-way shut-off and swivel aluminum handle. For general municipal work, where trees of the average size are being treated, we recommend our small Worthley nozzle, which is identical in design and construction to our large Worthley nozzle, except for a shorter tube and the omission of the aluminum handle.



"WORTHLEY" NOZZLES

Col. Sohier says, in speaking of these nozzles, "—was very easy to handle and from which a spray could be thrown over all the trees in the forest without climbing."



ALBEE "KANT-SLIP" HOSE COUPLING

The Albee "Kant-Slip" coupling, which is built by us for and after the design of one of the best known hose experts and with which all 1" hose sold by us is coupled, will resist several times the **pressure and pulling strain** as that of the regular long tail coupling. All hose sold by us is manufactured with special reference to high pressure work and is the same as has been in use in the North Shore work for the past six seasons.

GUARANTEE

We guarantee our sprayers to run satisfactorily when ordinary intelligent care and attention are given them. Our sprayers are tested carefully in the factory before shipping. We also guarantee them for one year against any imperfection in workmanship and material and any defective part will be replaced if returned to our factory, carriage prepaid, provided that the repairs are not necessary because of improper uses or neglect.

THE DUNBAR-KERR CO., PRINTERS
MALDEN, MASS.